

## CLAIMS

1. A method for communicating with a digital loop carrier, the method comprising:  
 receiving from a controlling entity line identification information specifying  
 connectable end points in the digital loop carrier, the connectable end points representing  
 5 one or more telephony bearer resources;  
 receiving from a controlling entity action information specifying one or more actions  
 to be taken by the digital loop carrier with respect to the connectable end points specified  
 by the line identification information;  
 generating a message that includes the line identification information and the action  
 10 information; and  
 sending the generated message to the digital loop carrier.
2. The method of claim 1, wherein receiving line identification information includes:  
 receiving line identification information that specifies a connectable end point in the  
 digital loop carrier by specifying any combination of a physical device, a node, a facility,  
 15 a channel and a telephony bearer resource in the digital loop carrier.
3. The method of claim 2, wherein receiving line identification information includes:  
 receiving line identification information that further specifies a bank, a network unit,  
 and a slot of the digital loop carrier such that the endpoint is unambiguously identifiable.
4. The method of claim 3, wherein generating a message includes:  
 20 generating a message that includes the line identification information in a channel  
 identification element of the message.
5. The method of claim 1, wherein sending a message includes sending the message  
 over an active link, the method further comprising:  
 providing a standby link as a backup to the active link.

6. The method of claim 5, wherein receiving action information includes:  
receiving action information specifying a link-protection-switch action that causes the digital loop carrier to switch the link on which the message is received from standby to active status.
- 5 7. The method of claim 6, further comprising:  
receiving acknowledgement from the digital loop carrier that the digital loop carrier has switched the link on which the message is received from standby to active status.
8. The method of claim 1, wherein receiving action information includes:  
receiving action information requesting hook status.
- 10 9. The method of claim 1, wherein:  
receiving action information includes receiving action information specifying multiple actions to be executed by the digital loop carrier;  
receiving line identification information includes receiving line identification information that specify multiple connectable end points; and  
15 the generated message results in the establishment of cross connects between endpoints in the digital loop carrier in accordance with the action and the line identification information.
10. The method of claim 9, further comprising:  
receiving acknowledgement from the digital loop carrier that the digital loop carrier  
20 has received and executed the message.
11. The method of claim 9, wherein sending a message includes sending the message over an active link, the method further comprising:  
providing a standby link as a backup to the active link; and  
sending the message to the digital loop carrier over the active link, wherein the  
25 message causes the digital loop carrier to replicate dynamic cross connects to the standby side.

12. The method of claim 1, wherein receiving action information includes:

receiving action information specifying a disconnect action that causes the digital loop carrier to release connectable end points identified by the line identification information.

5 13. The method of claim 1, wherein receiving action information includes:

receiving action information that queries for the presence or absence of a cross connection between the connectable end points specified by the line identification information, the connectable end points being cross connectable end points.

14. The method of claim 13, further comprising:

10 receiving a report from the digital loop carrier specifying the hook status of the connectable end point when the connectable end point is a subscriber end point.

15. The method of claim 1, wherein receiving action information includes:

15 receiving action information reporting locations of the cross connection currently established.

16. The method of claim 1, wherein generating a message includes:

generating a message that includes a correlation tag and message header information.

17. A method for enabling a digital loop carrier to operate as a next generation gateway, comprising:

providing one or more telephony bearer resources in the digital loop carrier;

receiving line identification information specifying connectable end points in the  
5 digital loop carrier, the connectable end points including the one or more telephony  
bearer resources;

receiving action information specifying one or more actions to be taken by the digital  
loop carrier with respect to the connectable end points specified by the line identification  
information;

10 generating a message that includes the line identification information and the action  
information; and

sending the generated message to the digital loop carrier.

18. The method of claim 17, wherein providing one or more telephony resources  
includes:

15 providing telephony resources for tone detection and generation.

19. The method of claim 18, wherein providing telephony resources for tone detection  
and generation includes:

providing telephony resources for detecting and generating pulse dialing,  
multi-frequency tones and dual tone multi-frequency tones.

20 20. The method of claim 18, wherein providing telephony resources for tone detection  
and generation includes:

providing telephony resources for generating a dial tone, a busy tone, a reorder tone,  
dual tone multi-frequency tones, multi-frequency tones, and special information tones.

21. The method of claim 17, wherein providing one or more telephony resources  
25 includes:

providing telephony resources for bridging multiple voice circuits together in a  
multi-party call.

22. The method of claim 17, wherein providing one or more telephony resources includes:

providing telephony resources for loop signaling.

23. The method of claim 22, wherein providing telephony resources for loop signaling includes:

providing resources for performing loop-start, ground-start, loop-reverse battery, and E&M signaling.

24. The method of claim 17, wherein providing one or more telephony resources includes:

providing frequency-shift-keying modem tones.

25. The method of claim 24, wherein providing frequency-shift-keying modem tones includes:

providing telephony resources for delivering calling-line-identification information and message waiting indication status changes.

26. A system for enabling a digital loop carrier to operate as a next generation gateway, the system comprising:

one or more telephony bearer resources configured to be situated in the digital loop carrier; and

an access switch that includes the intelligence to operate the telephony bearer resources and, furthermore, to control the digital loop carrier for telecommunication operations, the access switch being connected to the digital loop carrier and the telephony bearer resources.